Initiating Social Networks in E-Health Services to Support Empowerment

Abstract
Extending e-Health services with social networking through Web 2.0 is the main concern of this paper. This paper discusses how Web 2.0 applications will help healthcare providers extend and enhance their services by involving and empowering their customers. A survey was conducted in Malang, East Java, Indonesia to reveal expectations of potential users towards healthcare services that can offer empowerment through information, knowledge, and experience sharing in social media. The survey revealed that customers highly appreciate various features in e-health services such as consultation online, sharing in social networks, and empowerment in enriching their personal health records. Based on the survey, a prototype of an e-health system incorporating the expected features was developed for future research.

Keywords: Social Networks; Web 2.0; Empowerment; Online Health Educator; Indonesia

Introduction

Relationships between healthcare providers and their customers (patients) are complex. These relationships should be taken into consideration when dealing with patient satisfaction and empowerment. How do we incorporate these relationships in a system to promote patient’s empowerment? What are the impacts of patient’s empowerment in terms of e-health records?

Customers (patients) nowadays are actively using social media. Survey conducted in the United States revealed ninety percent of respondents from 18 to 24 years of age trusted medical information shared on social media.1 Good and bad experiences with services are shared through social media platforms and instant messengers. Good experiences lead to referral and recommendation for others, while bad experiences may lead to public distrust towards the services. It is important to capture patients’ conversations as these can provide important feedback for improving services which in turn can improve their satisfaction.

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The Internet, especially the Web, provides a mechanism to connect healthcare service providers and their customers online but it only supports one-to-one or one-to-many interactions or relationships. While, many-to-many or multi-ways relationships (networks), such as the relationship among customers can only be incorporated by Web 2.0. Web 2.0 is the 2nd generation Web technology characterized by a high degree of interactivity. Users can easily generate contents and actively participate in information and knowledge sharing sessions. Consequently, Web 2.0 has empowered users through contents generation in real-time and participation in information and knowledge sharing.

The recent advancement of Web 2.0 applications as well as their worldwide adoption have ignited the business world to embrace Web 2.0 as it provides a network-centric paradigm and interactivity that can help expand services to customers. Consequently, Web 2.0 will help business organizations move closer to their customers, offer them better services as well as strengthen relationships with them.

Web 2.0, such as social media, allows customers to contribute content, which can be utilized to build contextual relationships and facilitate information and knowledge sharing among customers, and between customers and their service providers. Therefore, customers have an opportunity to discuss their concerns, opinions or any information with other customers. Companies, in this case healthcare providers, can listen to their customers efficiently and then respond immediately or develop strategies to serve them better.

Healthcare services can be improved or enhanced through partnerships between healthcare providers and their patients. Web 2.0 provides tools to support and enhance these partnerships for mutual benefits. Also, Web 2.0 supports dynamic interactions amongst patients and patients with healthcare staff. Web 2.0 based patients’ engagement enables healthcare providers to simplify communication and collaboration among patients in creating mutual benefits by bringing the collective knowledge to achieve patients’ satisfaction.

In addition, patient empowerment can be enhanced through Web 2.0 tools such as social media so that they can contribute in enriching information exchange within social networks they belong to which can affect and improve their health literacy. Patients can use Web 2.0 as a platform to have conversations and interactions among themselves. Allowing interactions among patients to share information, knowledge and experience will empower them as they can learn from each other through the sharing and at the same time they can contribute content by participating in discussions or just by updating their health status or related activities, which might be useful to the healthcare staff in understanding patients’ health habits.

One of the important purposes of e-health is the education of patients as this can improve their health literacy. This can be done through Web 2.0 as part of services. Besides, e-health supported with Web 2.0 can be used to promote strong relationships between healthcare providers and their customers through enhancing trust and customers’ empowerment in health decision-making.
This study examines the process of initiating Web 2.0 in e-health services so that customers can improve their health literacy. A survey was conducted in Malang, Indonesia. The survey focused on social networks, empowerment, and online health educator as a supporting system in an e-health initiative. The output of the survey will be used as a user requirements phase to develop a Web 2.0 system to support e-health services. In this research article, we present the theoretical foundation of the study, the methodology, the results, and the future direction of the research.

**Theoretical Foundations**

This section exposes some of the studies done on Web 2.0 in healthcare organizations. There is an abundance of research on the social aspects of the literature. Many of these aspects support the theories in healthcare which have been derived from the fields of customer relationship management (CRM), psychology, sociology, and e-participation.

Web 2.0 tools such as social media can transform e-health services to be more customer centric activities promoting values for customers’ empowerment. The main advantage of social media is it provides ways to connect with people that may lead to information and knowledge sharing. In that sense, Web 2.0 tools can enhance healthcare by extending e-health services especially in providing multi-channel interactions between healthcare providers and their customers and among customers.

However, to fully make use of the interactions healthcare organizations need to engage, manage, and maintain relationships with customers. Engaging patients to share their experiences in healthcare processes, including treatments, using social network technologies is important as this will attract them in information and knowledge sharing activities.

In addition, embedding Web 2.0 in healthcare enriches patients’ experiences in getting information about healthcare services. The role of Web 2.0 in a healthcare organization is now gradually being recognized and incorporated in new terms in e-Health such as Health 2.0 or Doctor 2.0. In fact, the online community uses Web 2.0 tools for health continues to grow, and those terms have entered a traditional nomenclature. This section discusses interrelated concepts relevant to the study.

**Social Networks**

A social network is a system that contains objects such as people, groups, and other organizations linked together by a range of relationships. Some organizations build online social networks to understand customers’ ideas, feedbacks and even critiques from people outside the organisation. Online social networks help advance the relationships among customers and between customers with their service provider.

Web 2.0 provides tools to set up, expand and manage online social networks. In general Web 2.0 stimulates fundamental changes in the behaviors of customers where customers...
are empowered to generate contents and conversations. This is a great opportunity for organizations to incorporate Web 2.0 in their customer relationship management (CRM) strategy.\textsuperscript{12}

The communication revolution stirred by Web 2.0 has affected many areas, including healthcare.\textsuperscript{13} The growing adoption of social networking sites globally is an important area of research in healthcare.\textsuperscript{14} Most patients nowadays also utilize social networks to communicate and share information and experiences.

The Web or mobile applications are critical platforms in supporting CRM efforts. However, Web 2.0 is an influential technology for any business organizations to initiate interactions, develop collaborations, and strengthen relationships with customers.\textsuperscript{15} Embedding social networks through Web 2.0 is becoming important in CRM strategies as Web 2.0 tools such as wikis, blogs, and social media are aimed to facilitate customers’ engagement, empowerment, and collaboration among customers rather than just exchange emails and retrieve information only.\textsuperscript{16}

Social media have facilitated information and knowledge sharing in real time at low-cost. So, customers (patients) can be engaged in exchanging information and knowledge. Through sharing in social media, they may express their experiences about healthcare services, healthcare treatment, medications, and other related health activities.

The advancement of Web technology with its Web 2.0 has also affected the way CRM approach customers. Since CRM is part of a business strategy for managing customers, embedding Web 2.0 into CRM strategies is pivotal. Social media with the features of collaborative conversation can provide mutual benefits in a trusted and transparent business environment like healthcare setting. The term of embedding Web 2.0 into CRM strategies is known as Social CRM or CRM 2.0 (Figure 1). Indeed, CRM 2.0 will be needed in any business process including processes in healthcare to improve relationships with customers. As such, CRM 2.0 provides powerful new approaches to surpass traditional CRM.

CRM 2.0 will change the way people communicate and establish conversations. The change will not happen only with the healthcare service provider but also with other customers and the community at large. Table 1 compares the features of CRM 2.0 and CRM 1.0.\textsuperscript{17} It summarizes the distinctions between CRM 2.0 and CRM 1.0 based on value added, connection, and relationship. In terms of relationship, CRM 1.0 focuses more on one-to-one relationships, while CRM 2.0 supports one-to-one, one-to-many and many-to-many or multi-channels relationships in a more complex relationship network. The technology of CRM 1.0 supports limited numbers of interactions while social networks in CRM 2.0 support multiple interactions so that customers can gain more information and knowledge. CRM 1.0 constructs value creation from targeted messages while CRM 2.0 offers diverse value creation even from informal conversations with customers within social networks.
Online social networks have empowered customers to have more control over their relationships with organizations since they have access to new levels of education and information available to them. This creates impacts on all organizations, including healthcare organisations. Empowering customers can be a catalyst in boosting productivity in many organisations, including the healthcare sector.
Empowerment

The study discusses the model that highlights some pivotal characteristics of empowerment and social networks as strategies that need to be adopted in e-health or mobile health. The lack of participation of customers in any business sectors was the main obstacle to the empowerment of customers. Health problems manifest mainly from health literacy and dissatisfaction of customers in e-health services which may be due to the lack of customer empowerment, no social interactions between customer and health provider, as well as no dedicated online health educator who looks after the service.

Traditionally, healthcare providers view patients as the recipient of care, hence all healthcare related treatments and decisions are determined by the providers. As a result, participation from patients is very limited. Although many patients choose to fully trust their healthcare providers making decisions for them due to the difficulty in selecting the available options or the time needed to understand health problems and the options, patients’ opportunity to participate in decision processes for their health should be considered. This traditional view is the main obstacle for patients’ empowerment. 19

Patient empowerment emerges as a response to the concern that patients should be involved in healthcare processes. Empowerment in health care is not new as it has been discussed in the healthcare literature over the past decade. 20 Patients’ empowerment is facilitated by healthcare organisations. It is the process whereas the power is partially or fully transferred by healthcare organisations to patients. 21, 22

Empowerment in healthcare can be seen from three perspectives; from the perspective of healthcare providers 23, 24, 25, 26, from the perspective of customer or patient 27, 28, 29, 30, and both perspectives. 31, 32 From the patient point of view, empowerment is a process of personal transformation to gain control over their health and access knowledge and information related to their health. Patient’ empowerment can emerge through active sharing and collaboration in healthcare. For healthcare organisations, empowerment implies the provision of necessary tools and mechanisms for healthcare staff to be able to resolve through online problems or queries faced by patients. Healthcare staff can interact with their patients directly, reducing the number of dissatisfied patients who would otherwise have complained. 33

Web 2.0 enables patients to have a greater role in healthcare processes as they can generate information to enrich their healthcare records. Web 2.0, if accommodated, will change the role of patients from the recipients of care, a passive role, to those who actively participate in their healthcare activities.

The issue of patient empowerment in e-health has been discussed in the literature. Australia is a pioneer in empowering patients in healthcare through a Personally Controlled Electronic Health Record (PCEHR) 34, which is now called My Health Record. Patients are allowed to view their health information stored in My Health Record online securely. My Health Record empowers patients by giving them control over their health information. Through this control, they can decide which information can be incorporated and those that
can access the information. This means they can share their health information with doctors, health providers or anyone if they intend to.

However, My Health Record does not yet support Web 2.0 features. This indicates that further study is needed to utilise the features of Web 2.0 that allow collaboration and conversation. Therefore, the study is also aimed to gather customers’ opinions that facilitate the features of Web 2.0 needed to meet the significant challenges in patient empowerment in the healthcare setting.

In addition, leveraging Web 2.0 for the benefit of e-health is another area where a greater effort can make a difference to establish better processes and systems with the focus on improving efficiency, effectiveness, inclusion and sustainability.35, 36

**Healthcare System and Internet in Indonesia**

The study was conducted in Malang, East Java, Indonesia. Malang is an autonomous region, the second city in East Java after Surabaya. It has about 73 healthcare centres with 800,000 inhabitants in 2007.37 The private sector is increasingly important in the provision of healthcare in Indonesia, especially in the major cities, with wide variations in quality of care.

Indonesian National Health Survey showed that the number of community public healthcare centres (Puskesmas) in Indonesia was 7,277 units including Puskesmas at a regional level, sub-district level and village level. Moreover, the survey identified that over 30% of the Indonesian population used Puskesmas to get essential medical services.38 The general decentralisation process implemented in 2001 had an impact on the healthcare system particularly health financing, health information system, and human resources for health and service provision. Under decentralisation, responsibility for healthcare provision is largely under authority of district governments.

Indonesians are strong adopters of the Internet technology. It brings a promise for further innovation in terms of Internet services including e-health services. The explosion of digital media in Indonesia is an effect of Internet usage and smartphone adoption along with many other factors which could encourage or dampen the use of social networks applications.39 These include its demographics, Internet-related statistics and its current state of traditional and mobile media, upon which Indonesia still relies upon. By the year 2000, the Internet users in Indonesia were estimated to be 4 million.40 However, the Internet users have increased to 30 million or 12 % of the total population by 2010.40 The number of Internet users in 2011 quickly reached 55 million; 29 million of them are mobile Internet users, indicating that more than 50% of Internet users in Indonesia use smartphone for instant messaging or social networks. This gives the implication that Indonesia has reached 23% Internet penetration rate, and it is dominated by the major cities, only 4.1% in rural areas.
The Internet penetration is expected to rise significantly in the years to come as technology becomes more affordable. Social media is typically used for sharing and bonding. Indonesia is the 4th-largest Twitter nation worldwide. As of January 2011, there were more than 4 million Twitter accounts established by Indonesian users. Almost 20.8% of online users in Indonesia visited Twitter in June 2010. Currently, there are 44 million Facebook users in Indonesia, which makes it number 4 in the ranking of Facebook statistics by country. Facebook penetration in Indonesia is 18.21% of the country’s population and 147.45% of the Internet users.

Methods

Our primary objective is the utilization of social networks to support patient’s empowerment through customer relationship management in e-health context. We developed questionnaires derived from various features offered by social networks to support patient’s empowerment. Before the questionnaires were distributed, we did a pilot test with a group of potential users (representative from patients and doctors) to make sure that it could be easily understood. Then, the questionnaires were distributed to the purposive sampling respondents that were intentionally selected from patients, patients’ family, and medical staff from the clinic in Indonesia. 108 respondents participated in the study. Data gathered from the survey was examined, interpreted and converted as requirements to develop a proposed framework of social networks in the e-health scenario. Then, a prototype of e-health with Web 2.0 was developed.

Analysis

First, we examined the internal consistency and reliability of questionnaires using Cronbach’s alpha as in (A). Whenever, Cronbach’s alpha is greater than or equal to 0.6, then the variable is reliable. N is equal to the number of articles, a bar is the average inter-item covariance among the items, and v-bar equals the average variance. Cronbach’s Alpha was found to be 0.624 from the 19 items investigated, indicating that the variables are relatively reliable and consistent since it is greater than 0.60. Table 2 indicates the characteristics of the respondents.

\[
\alpha = \frac{N \cdot \bar{c}}{\bar{v} + (N - 1) \cdot \bar{c}} \quad (A)
\]

Observing the relationship between the variables of rows and columns, we employed chi-square analysis, the Pearson Chi-Square rows and columns asymp. Sig. (2-sided). This demonstrates the value of probability. From the analysis, we found that there is a relationship between educational level and information communication technology (ICT) literacy, educational attainment and access to online health services, educational level and payment online services, gender and access to online health services, gender and amount of online services. We asked the respondents many issues regarding health information on the Internet, empowerment features in health service, availability of online health educator, social networks in e-health services, and the effect of those services in improving health literacy and customer satisfaction (Table 3). When we asked the respondents if they also
used the Internet to get information about information, health science, or a health reference,

96% of them used the Internet to look for medical and health information. We questioned the preference of 57% that they used Web/Apps to look for diseases and 22% looked for healthy lifestyle, 7% for health support and recommendation, and 13% was information about healthcare services.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Component</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>20 years or younger</td>
<td>7.4 %</td>
</tr>
<tr>
<td></td>
<td>21 - 30</td>
<td>76 %</td>
</tr>
<tr>
<td></td>
<td>31 - 40</td>
<td>11 %</td>
</tr>
<tr>
<td></td>
<td>41 - 50</td>
<td>3.7 %</td>
</tr>
<tr>
<td></td>
<td>51 years or older</td>
<td>1.9 %</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>27 %</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>73 %</td>
</tr>
<tr>
<td>Education</td>
<td>Completed high school</td>
<td>24.3 %</td>
</tr>
<tr>
<td></td>
<td>Completed Diploma</td>
<td>42.0 %</td>
</tr>
<tr>
<td></td>
<td>Completed Degree</td>
<td>31.8 %</td>
</tr>
<tr>
<td></td>
<td>Completed Postgraduate</td>
<td>1.9 %</td>
</tr>
<tr>
<td>ICT Literacy</td>
<td>Not at all</td>
<td>7.4 %</td>
</tr>
<tr>
<td></td>
<td>Basic User</td>
<td>17.6 %</td>
</tr>
<tr>
<td></td>
<td>Medium User</td>
<td>48.1 %</td>
</tr>
<tr>
<td></td>
<td>Advance User</td>
<td>26.9 %</td>
</tr>
<tr>
<td>Internet Usage</td>
<td>At least daily</td>
<td>75 %</td>
</tr>
<tr>
<td></td>
<td>Weekly</td>
<td>20.4 %</td>
</tr>
<tr>
<td></td>
<td>Monthly</td>
<td>1.9 %</td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>2.8 %</td>
</tr>
</tbody>
</table>

Accessibility of Online Health Information

The concerns of people on participation, accessibility or customer-centric, and empowerment gain much attention in e-health implementation around the world. The survey focused on patients’ accessibility of digital health information. The study asked patients’ agreement if they can view and access their medical records through Web/Apps. It shows that 22% strongly agree and 47% of the respondents agree preferring to view and have access to their own medical records. Accessibility becomes an important part of patient’s empowerment. Conversely, in the old paradigm it is almost impossible for patients to get access towards their own electronic medical records and histories since healthcare providers keep those records only for healthcare staffs. In many cases, patients may request their own electronic medical histories, however it is under strict and limited access. It gives a challenge on how patients can improve their medical awareness if they are not able to view the medical histories. In this case, many respondents agreed that they need to have facilities.
TABLE 3: SURVEY RESULTS

<table>
<thead>
<tr>
<th>Variables</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Empowerment</strong></td>
<td></td>
</tr>
<tr>
<td>• Viewing electronic medical records</td>
<td>69 %</td>
</tr>
<tr>
<td>• Recording own health activities Web/Apps</td>
<td>75 %</td>
</tr>
<tr>
<td><strong>Social networks</strong></td>
<td></td>
</tr>
<tr>
<td>• Sharing health service with others</td>
<td>72 %</td>
</tr>
<tr>
<td>• Supporting group in social networks</td>
<td>93 %</td>
</tr>
<tr>
<td>• Discuss with patients with similar condition</td>
<td>80 %</td>
</tr>
<tr>
<td><strong>Online Health Educator</strong></td>
<td></td>
</tr>
<tr>
<td>• Making online consultation</td>
<td>83%</td>
</tr>
<tr>
<td>• OHE must stand by</td>
<td>92%</td>
</tr>
<tr>
<td><strong>Extended E-Health Services</strong></td>
<td></td>
</tr>
<tr>
<td>• Paying service online</td>
<td>39%</td>
</tr>
<tr>
<td>• Emotional &amp; Spiritual effects on physical health</td>
<td>100%</td>
</tr>
<tr>
<td>• In overall, improve health literacy</td>
<td>64%</td>
</tr>
<tr>
<td>• In overall, improve customer satisfaction</td>
<td>87%</td>
</tr>
</tbody>
</table>

to access or view the summary of their medical histories. The report of the electronic medical histories may lead to improving patients’ self-awareness. Accessibility empowers patients to ensure their records are correct so that there is mechanism of check and balance from patient’s perspective. Though, there is always a challenge for accessibility when some of respondents disagreed (30%) because the issue of complexity in managing their own electronic medical records especially for senior citizens who are not conversant with ICT.

Additionally, we asked the preference of patients to have the ability in adding their health activities into e-health systems. There are many mobile apps that enable people to track calories, sleeping habits, blood pressure charts, etc. There are 75% of the respondents desired to be able to record their daily habits that may affect their health directly or indirectly. Empowerment is not only the ability to view their medical records but also supporting patients to enrich their own health habits so that they are able to update and monitor own health status. For instance, customers can record their personal habit like eating, exercises, hobby, weight, even blood pressure. Those records can be used when consulting with medical practitioners. There are 25% respondents disagreed possibly because of fear from information breach or manipulation.

**Sharing and Support Group**

Nowadays, people are connected to many social networking sites. They share and discuss many issues concerning their interests. In the present study, we are interested in figuring out the effect of social media in healthcare settings. First, we asked the respondents of their
agreement on the ability of customers to share their experiences in the social networks in regard to the service they receive from healthcare providers. It revealed that 72 percent of the participants agreed that they will share their experiences regarding the medical services they receive. Participants believe that sharing experiences affect health services. On the other hand, some respondents differed, 18% (disagree) and 10% (strongly disagree) because they believe that social networks have nothing to do with healthcare services. This is perhaps because today close management is practised in all health organisations. There is no reference or evidence of sharing via social networking being able to aid in any health-related issues.

Further, we asked that if sharing between patients with a similar condition in social networks can be beneficial. Majority of respondents (80%) are willing to have a connection and conversation with other patients who have the same health conditions through social media provided. Patients with similar healthcare problems may exchange experiences and information through the platform leading to supporting each other. Finally, we asked if support groups in social networks can make patients more resilient and confident in acting or making any decision regarding their health. It showed that 93% of respondents confirmed, while only 7% disagreed that support groups can be achieved via social networks.

Extended services

Patients’ centric paradigm views patients as sources of information that should be given an active role in the entire healthcare activities including decision making. However, there are always challenges on the quality and ability of each patient by empowering them as partner in healthcare processes. Therefore, it is urgent for any e-health system to assign a specific healthcare online staff as an online health educator to make sure that the information produced from patients is verified on its reliability and quality. The survey revealed that most respondents agreed that they need online health educators (27% strongly agree, and 56% agree) to improve e-health service.

We also asked how quickly online health educators should respond to any online queries from patients. Again, respondents confirmed (92%) that online health educators must respond promptly to ensure that patients are being catered accordingly without any delay. This shows that whenever e-health service is offered, the response is expected to be prompt, without delay as patients believe that online service should be faster and more efficient. The study also examined patients’ belief that physical health is also affected by other factors such as emotional, psychological, and spiritual condition of the person. It shows that 65% strongly agreed and 35% of participants agreed, while nobody disagreed.

Finally, the last two questions asked were about health literacy and customer satisfaction. Firstly, e-health activities such as access to online medical records, online consultation and online discussion with other patients can improve health literacy. It shows 22% of respondents strongly agree, 42% agree, 30% disagree, and 6% strongly disagree. It is believed that embracing social networks in healthcare scenario enhances services. Secondly, “Will customers (patients) be more satisfied with the service if a healthcare
organisation provides online services where patients can access their online medical records, consult online, and discuss with other patients online?” The result shows most respondents confirm (30% strongly agree, and 57% agree) that those facilities will make them more satisfied if it is offered. It signifies that e-health service with Web 2.0 tools is believed to improve their health literacy and customer satisfaction. The finding of this section will be used to recommend the implementation of Social CRM in e-health environment.

**Discussions**

This survey is the first survey in Indonesia focusing on Web 2.0 in e-health systems. Data was analyzed to construct a prototype and recommendations. Nineteen questions in the survey instrument were clustered into three parts. The first part contained demographic traits of respondents to find out their gender composition, employment, and age segmentation, the level of education, ICT literacy, and Internet literacy. The second part had nineteen variables related to features of e-health services and its accessibility. In this section, we discuss the findings and how they relate to the theories of e-health.

Customer Relationship Management (CRM) is an organizational strategy designed to optimize profitability, revenue and customer (patient) satisfaction. E-health with Social CRM will enhance online health services, complement, extend, and improve the existing services. For example, it offers e-health services that are faster and more efficient and online health records can be accessed anytime-anywhere. The survey confirmed that the expectations of empowerment in e-health are tremendous, creating challenges for any healthcare provider.

From the survey, we identify critical success factors that provide direction to where the e-health initiative should be heading. Managing those critical success factors is essential for successful Web 2.0 initiatives in the future e-health implementation. This research indicates that demographic; employment, age composition, education levels, ICT literacy, and Internet literacy that make up typical e-health initiatives are important parameters. It is interesting to see how demographic conditions affect the preference of respondents towards features of Web 2.0 in e-health services; this provides insight into their relative impact on e-health systems. Respondents to the survey are relatively distributed; they were both patients and healthcare staffs. Both types of respondents support the accessibility of medical records, empowerment, and social networks in e-health services. The level of education will affect the acceptability of systems and competency of people to utilize it. In this study, two-thirds of the respondents hold graduate diplomas. Hence, their education level is relatively high, helping them to quickly grasp e-health initiatives, including incorporating Web 2.0 on those initiatives.

All participants have access to the Web/Apps and they use the Internet almost every day. Thus, e-health with social networks services have the potential to be adopted if it addresses the needs of people. This further supported that ICT literacy in the urban area is relatively high and ICT literacy is an enabling factor of e-health initiatives. This survey found that
respondents are conversant with Web / Apps literacy. This suggests that most of the population are computer literate and finding information or interacting using computers is not a problem. In summary, most respondents are educated and they are proficient in ICT as well. This can be the main reason as to why they support the implementation of an e-health system for incorporating Web 2.0 features. The next section discusses our findings based on the survey in three categories: empowerment, social networks, and online health educator.

Empowerment

The e-health approach requires more patient centric paradigm. The study revealed that empowerment in e-health is highly recommended to meet patients’ interest. The survey amplifies the trend of e-participation that patients expect to improve availability and accessibility of service through quality of e-health services with empowerment through social networks. Social networks promote empowerment where patients are facilitated by sharing information and experiences. Social CRM is the enabler of empowerment and participation through social networks as it provides a convenient way to participate in patients’ interactions as well as controlling the flow of information.

There are two questions directly asked about patients’ empowerment in e-health services. Firstly, we inquired about the possibility of customers to access their medical records online. Secondly, we asked the respondents about features that enable customers (patients) to record and monitor their health habits online. It is important to note that though there is an even distribution of respondents comprising of medical staffs and non-medical staffs (customers), on average 72% of respondents supported empowerment in e-health services. It indicates that the majority expects to see online services, which empower them to participate in the process of care.

However, those who disagree are mainly concerned with the medium of medical records accessed. In principle, the contents of the medical record belong to patients; while the medical record file (physically) is the property of the hospital or health institution. The statue 749a of Act number 10 of the Indonesian Ministry of Health states that medical record files owned by healthcare organizations should be kept at least five years from the date of the last patient treatment. Because the patient holds the contents of medical records, a doctor or any medical staff can say about the content of the patient’s medical record, except in certain circumstances that force physicians to act otherwise. Conversely, because a medical record file is owned by an organisation, a patient cannot access the file if the healthcare institution refuses to do so.

Empowerment encourages patients to be responsible for their own health status and to take a greater role in own health decisions with the help of healthcare staff. The study established the preference of patients’ empowerment concerning their health sharing and caring in social media platform. Empowerment enables them to make appointment online, viewing medical records and histories, and making consultation online are few examples of empowerment. Empowerment will benefit both patients and healthcare providers where patients may understand better their health status and the healthcare provider will gain
better trust because information openness and sharing. Finally, the study suggests that empowerment within e-health system consists of patient-patient interactions through social networks, self-patient empowerment in accessing their medical records through Web/Apps, and patient-healthcare provider interaction through online health educators.

Social Networks

Social networking sites would force healthcare service to rethink how they approach relationship with their patients. Sharing through social media affects health outcomes. The study confirmed that empowerment through social networks is needed by patients and should be integrated into e-health systems. Social networks in e-health must be managed and maintained by online health staffs and educators to ensure the quality of services as well as reliability of the information being shared.

From there also care centers can learn how to increase their attention to the Patients. Some questions were asked about social networks in healthcare environments. First, whether they may share information and experiences through social networks regarding the service they receive from healthcare providers. Almost all respondents agreed that they would use the facilities of sharing with others if healthcare provider offers it. Secondly, most respondents confirmed that sharing between patients with a similar condition could be beneficial for them as they can share experiences about their conditions that might be helpful for others. Patients with similar health problem may share their information and experiences to support each other. There must be a proper channel for customers to express their feelings regarding the service they receive from a healthcare provider. A healthcare provider through a social network site (preferably internal site) can provide this channel. Any concerns or issues raised can be monitored and handled wisely. This can be good feedback for the provider to improve its service to its patients.

The use of Social CRM in healthcare must be carefully designed to be able to benefit all parties, not only to patients but also to healthcare providers and the community. Based on the results of the survey, we propose that the provision of Social CRM where customers (patients) can express their satisfaction or dissatisfaction through the media that they maintain is within their internal system. A healthcare provider can incorporate features of social networks into their e-health system whereby users who have authorization can take advantage of these facilities. This strategy can prevent undesirable situations that may jeopardize the image of the organization. With this in mind, the healthcare provider can accommodate Web 2.0 into their organizational strategy and practices. The survey results confirm the idea of Social CRM which concerns that technology platform, business rules, processes, and social characteristics, is designed to engage the customer in a collaborative conversation to provide mutually beneficial value in a trusted and transparent business environment. It's the organizational response to the customer's ownership of the conversation.
The study highlights the results that the availability of OHE (Online Health Educator) is critical. Every OHE is expected to have sufficient skills in ICT and healthcare practices at the same time to be able to assist patients. For instance, in an emergency, OHE through social networks within Social CRM are able to distribute and notify the public about preventive actions and the necessary measurements. Social CRM is quick and cheap, even patients who are more introverted and uncomfortable with direct interaction still can express themselves freely within the platform. One of the utmost benefits from the empowerment of Social CRM is the ability to monitor patients’ progress anywhere and anytime.

The challenges of Social CRM in e-health system to promote empowerment includes ICT’s patient literacy as it may differ and some of them may even have very low ICT literacy. The role of OHE is to educate patients on how to use the system and utilize the system to promote online sharing and experiences. In fact, the presence of OHE determines the success of the patients’ empowerment. Patients will communicate excessively with OHE as well as other patients, leading them to have better information and access over their health records.

Assigning the role of OHE is part of the implementation strategy to ensure that there are groups of staff managing e-health activities in a professional way. For instance, patients who are not able to come for consultation directly to the hospital can accomplish it through an online service and arrange online consultation with OHE. E-health must provide more efficiency and effectiveness in terms of access without sacrificing quality. OHE will assist and guidance from Web / Apps when they face difficulties interacting with systems, or with OHE specialist, or during interaction with other patients. OHE plays a vital role to discuss for education, clarification, and interpretation of medical data, health activities, online consultation, online treatment, online prescription and others.

**Conclusion**

Empowering patients enables a patient centric paradigm and at the same time improves patient’s awareness of their own health. Patient empowerment can be initiated from adopting Social CRM into the e-health systems. Social CRM enables patients to share information and experiences through their Web / Apps. In addition, by providing a social network in which patients can express their concerns, hesitation and ideas without fear and without being judged so that discussions took place between the patient to exchange information and provide support. The study has confirmed the acceptance of patients with massive support for the features and capability of patients’ empowerment in e-health listed from the questionnaires. Majority of respondents agreed in having e-health services with the features of empowerment and social networks because empowerment in e-health system promotes convenience, efficiency in service, health promotion, accessibility, improving health literacy.
Conflicts of Interest
None declared.

Abbreviations
CRM: Customer Relationship Management
EMR: Electronic Medical Records
EHR: Electronic Health Records
ICT: Information Communication and Technology
PCEHR: Personally Controlled Electronic Health Records
OHE: Online Health Educators

References


